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# REGIONAL RECREATION DATA PROGRAM FOR THE NORTHWEST

June 1975

Recreation Data Subcommittee  
pacific northwest RIVER BASINS commission  
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#### ACKNOWLEDGEMENTS

The development and establishment of the data program as a viable planning tool for the Northwest would not have been possible without the cooperation and dedication of a number of key individuals.

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Paul Benson, Pacific Northwest River Basins Commission, Vancouver.

Ken Kirkland, Washington Department of Highways, Olympia.

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# **A REGIONAL RECREATION DATA PROGRAM FOR THE NORTHWEST**



**prepared by**  
**Recreation Data Subcommittee**  
**Recreation Committee**  
**pacific northwest RIVER BASINS commission**



PACIFIC NORTHWEST  
RIVER BASINS COMMISSION



COLUMBIA RIVER • P. O. BOX 908

VANCOUVER, WASHINGTON • 98660

OFFICE OF THE CHAIRMAN

FOREWORD

This report, "Regional Recreation Data Program for the Northwest," is a product of 18 months work by the Recreation Committee and the Recreation Data Subcommittee of the Pacific Northwest River Basins Commission.

It is another splendid example of the capabilities and experience of the Commission's standing technical committees.

The effort herein marks the first time in the nation a group of states have successfully worked together to develop the basis for an integrated recreation planning process and stems from the Pacific Northwest River Basins Commission's need for comparable recreation data from each of the Commission's participating states in the preparation of its Comprehensive, Coordinated Joint Plan.

At Kalispell, Montana, on June 12, 1975, the Pacific Northwest River Basins Commission approved for printing and distribution the draft document with the Commission's commendation for an outstanding accomplishment and, at the same time, requesting comments on the report.

  
Donel J. Lane, Chairman  
Pacific Northwest River Basins Commission



## PREFACE

The lack of standardization of recreation data, both activities and supply, has long plagued planners and administrators. This report presents the results of a successful effort between state and federal agencies of the Pacific Northwest River Basins Commission to overcome this obstacle.

In demonstrating the advantages of standardized data for regional and interstate planning, the report modifies and uses a gravity model developed by the U.S. Department of Transportation. In adapting a travel model to this purpose it was necessary to make a number of assumptions and arbitrary decisions which have not been validated. It is felt that these assumptions and decisions were reasonable. However, great care must be exercised in using this model or the projections in this study for future decisions. For example, as is pointed out in the text, energy requirements between now and 2020 may well so modify highway travel as to make any use of this model completely invalid. Other assumptions and factors need further testing and refinement.

It is hoped that this study will be used as a breakthrough for the standardization of planning data, as a challenge to planners to measure activity or use data and supply or resource data in relatable terms, and as a jumping off place for the further development and refinement of data collection methods, and of models or other techniques that can provide reasonable estimates of future needs.

## SUMMARY

The Northwest States of Washington, Oregon, Idaho, and Montana have joined together with several Federal agencies in a cooperative regional recreation planning endeavor to produce a uniform, coordinated data base for recreation planning. The need for improved regional recreation planning information has been recognized by planners and managers for some time. The Pacific Northwest River Basins Commission's Comprehensive Coordinated Joint Plan brought this need into focus by requiring comparable data from each of the participating States. To facilitate the coordination and standardization of recreation data, a work group made up of the four States and selected Federal agencies was formed.

State participation on the work group was by the agency having primary responsibility for Statewide Comprehensive Outdoor Recreation Planning under the Land and Water Conservation Fund Act, therefore insuring that recreation planning for both objectives would be complementary and mutually beneficial.

Accordingly, the objectives of the work group were:

1. To develop a uniform methodology for compiling and processing outdoor recreation data;
2. To meet the recreation data requirements of the Comprehensive Coordinated Joint Plan; and

3. To provide a coordinated data base for State Comprehensive Outdoor Recreation Planning.

Once the work group began functioning and the objectives set, the importance of a continuing data program was realized. In response, the work group was made a standing subcommittee of the River Basins Commission's Recreation Committee and broadened its membership to include representatives from other agencies involved in the acquisition and use of recreation planning information.

The program that was designed utilized a gravity model to distribute recreation use by activity, from county of origin to county of destination. Recreation use was distributed geographically using a highway network while taking distance and resource attractiveness into account. Estimates of future recreation use for 1980, 2000, and 2020 were made by projecting future population and future per capita participation rates.

For the gravity model to function, standardized data were required from each State. A number of early decisions regarding standardization were made.

1. A county building block approach to planning areas was adopted;
2. Activity occasion was adopted as the measure of recreation use for the study; and

3. A standard list of 16 outdoor recreation activities was selected.

The presentation of output data is beyond the scope of this report; however, selected data is used for illustrative purposes. A separate data package has been produced and has been provided to state and regional planners.

This effort marks the first time in the Nation a group of states has successfully worked together to develop the basis for an integrated recreation planning process. It is hoped that this effort will serve as an example for other regions to follow

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## I. GENERAL



### A. INTRODUCTION

Comprehensive outdoor recreation planning has traditionally been expressed through the preparation of a Statewide Comprehensive Outdoor Recreation Plan (SCORP) prepared to establish state eligibility for Federal Land and Water Conservation Funds. The data input and methodology of each SCORP has varied even though each had similar guidance. Since the methods employed and data collected were substantially different between plans, it became difficult to aggregate information. Data needs for effective planning often transcend state lines requiring a regional base. Due to a lack of standardization, such needs have often gone unfulfilled, or various sources more amenable to aggregation, but not necessarily better,

have been used. The need, therefore, for a unified regional (multi-state), comprehensive (multi-agency) outdoor recreation planning effort was clear. No single agency or group, however, appeared to have the authority, responsibility, or funds to independently implement such an effort.

When the Pacific Northwest River Basins Commission (PNRBC) began seeking recreation information for use in its Comprehensive Coordinated Joint Plan (CCJP) from the several States and the many agencies involved, the need for uniformity of recreation terms, data, and data processing became acute. An analysis of the problems revealed that different terms were used to define the same item, similar terms were used to define different items, standards varied widely, different planning areas were used (i.e., in one State, one agency prepared plans on river basins, another on special district boundaries), different types of data were presented, and projections of future population and activity trends were inconsistent.

The outdoor recreation planners responsible for compiling recreation data saw the CCJP as a catalyst to promote regionally coordinated recreation planning. The planners believed that the existing recreation plans had a substantial amount of data which, if defined and analyzed in a uniform manner, could provide data to the CCJP which would be better for regional planning purposes than using each plan individually.

As a result of a motion approved at its September 6, 1973, meeting, the Pacific Northwest River Basins Commission requested its Recreation

Committee to develop the coordinated regional recreation use projections needed for the CCJP and level B study program. Responding to this request and to the interest of the Regional Director of the U. S. Bureau of Outdoor Recreation, the committee established a work group to undertake the project. In addition to the Bureau of Outdoor Recreation, agencies represented on the work group included the Washington Interagency Committee for Outdoor Recreation, Washington Department of Ecology, Idaho State Park and Recreation Department, Oregon State Parks and Recreation Branch, U. S. Forest Service, and U. S. Economic Research Service, with staff liaison from the River Basins Commission.

Initial program development work was done by this Work Group. Later as the utility and applicability of this effort was recognized, more formal establishment was desired to insure the long-term continuance of the program. In January 1975, the Recreation Committee established a standing subcommittee, the Recreation Data Subcommittee. This action, coupled with the following resolution of support by the Pacific Northwest River Basins Commission (March 20, 1975), insured a continuing organizational structure for the program (see Figure 1).

"WHEREAS, more accurate, current and relevant data on which to base investment decisions for recreation developments both public and private are essentially important to the economy and social well being of the Pacific Northwest;

"WHEREAS, attempts by states to account for out-of-state visitors have met with only meager success largely because of the lack of comparable data for neighboring states;

ORGANIZATION CHART  
REGIONAL RECREATION DATA PROGRAM

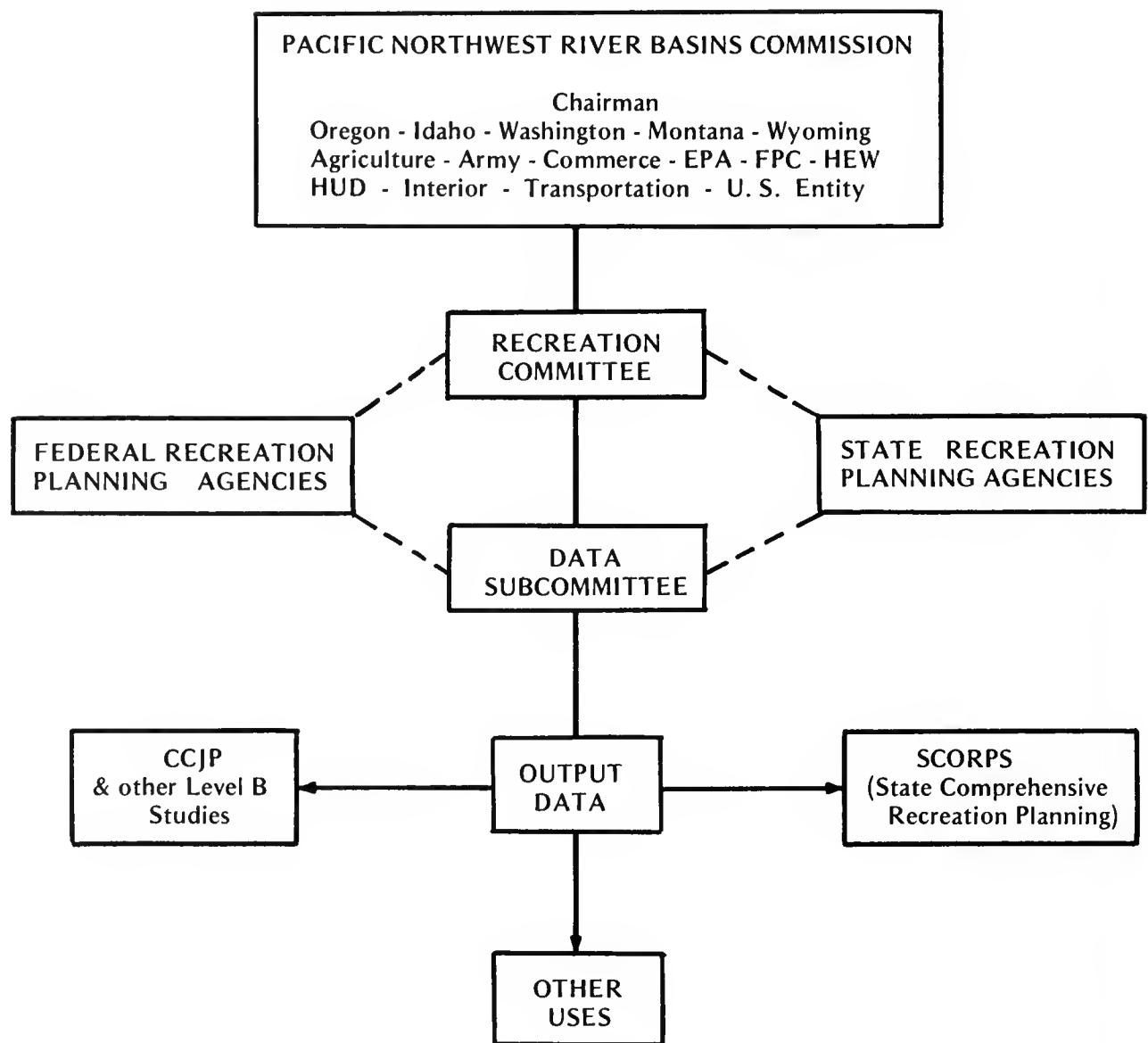


FIGURE 1

"WHEREAS, the several state recreation planning agencies and the BOR are in agreement that a coordinated data base would be a vast improvement over present conditions;

"WHEREAS, the Northwest states under the auspices of the Pacific Northwest River Basins Commission's Recreation Technical Committee have undertaken the task of developing a regional recreation data base for planning purposes;

"WHEREAS, these same states have contributed considerable manpower to develop the regional recreation data program;

"WHEREAS, funding for data collection and processing is limited and state budgeting procedures make the likelihood of unified funding from state sources very uncertain and tend to inhibit joint undertakings;

"NOW THEREFORE BE IT RESOLVED, by the Pacific Northwest River Basins Commission that,

- (1) The Commission affirms its support of the Regional Recreation Data Program as developed by its Recreation Technical Committee.
- (2) The Commission recognizes the advantages of concurrently collecting data in a regionwide coordinated manner.
- (3) That the Commission encourages the continued support of the Recreation Committee to the Regional Recreation Data Program.
- (4) The Commission agrees that current and accurate recreation data should be collected and analyzed at the earliest possible date on a continuous basis.
- (5) That the Commission, in recognition of the importance of this data program, hereby encourages potential funding bodies, such as the Pacific Northwest Regional Commission, to also favorably view data collection and processing proposals related to this data program."

The PNRBC agreed to serve as fiscal agent for the computer work necessary to the project. Each of the three States agreed to contribute \$1,000 to the project with the Bureau of Outdoor Recreation providing \$2,000. The Subcommittee, acting through the PNRBC, entered into an agreement

with the Washington State Department of Highways whereby their existing computer capability and gravity model programs would be utilized to accomplish the project.



#### B. PROGRAM OBJECTIVES AND SCOPE

The Comprehensive Coordinated Joint Plan of Study directs that projections and resource requirements be developed for recreation. Subcommittee members interpreted this charge in broad terms. Member planners set forth the planning goals and objectives of their agencies. These objectives, along with the PNRBC requirements for the CCJP, set the framework within which a program design was developed.

The objectives of the data program were determined to be:

1. To develop a regionwide methodology for compiling and processing outdoor recreation data, which includes a common set of recreation terms and definitions;
2. To meet the data requirements of the Comprehensive Coordinated Joint Plan; and
3. To provide a data base from which State Comprehensive Outdoor Recreation Planning can be done that reflects both intrastate and interstate recreation travel patterns.

The CCJP study required that recreation use information and resource requirements be provided for 1970 (base year), 1980, 2000, and 2020. The state agencies involved were those responsible for either river basin planning or the Statewide Comprehensive Outdoor Recreation Plans required under the Land and Water Conservation Fund Act (P.L. 88-578). The state agencies responsible for SCORP planning wanted assurances that products of this effort would be usable for state comprehensive planning. The data program was, therefore, designed to meet SCORP data base requirements as well as CCJP needs.

In order to meet CCJP study needs and because of funding limitations, it was necessary to limit the scope of the program to an analysis of existing data. Raw data which had previously been collected and analyzed by state and Federal recreation agencies was redefined and reanalyzed

within the framework of a program design developed by the work group.

These analyses will be discussed further under "Program Design."

The area encompassed in the study includes the States of Washington, Idaho, and Oregon, the 11 western counties of Montana, and Teton County, Wyoming (see Figure 2).

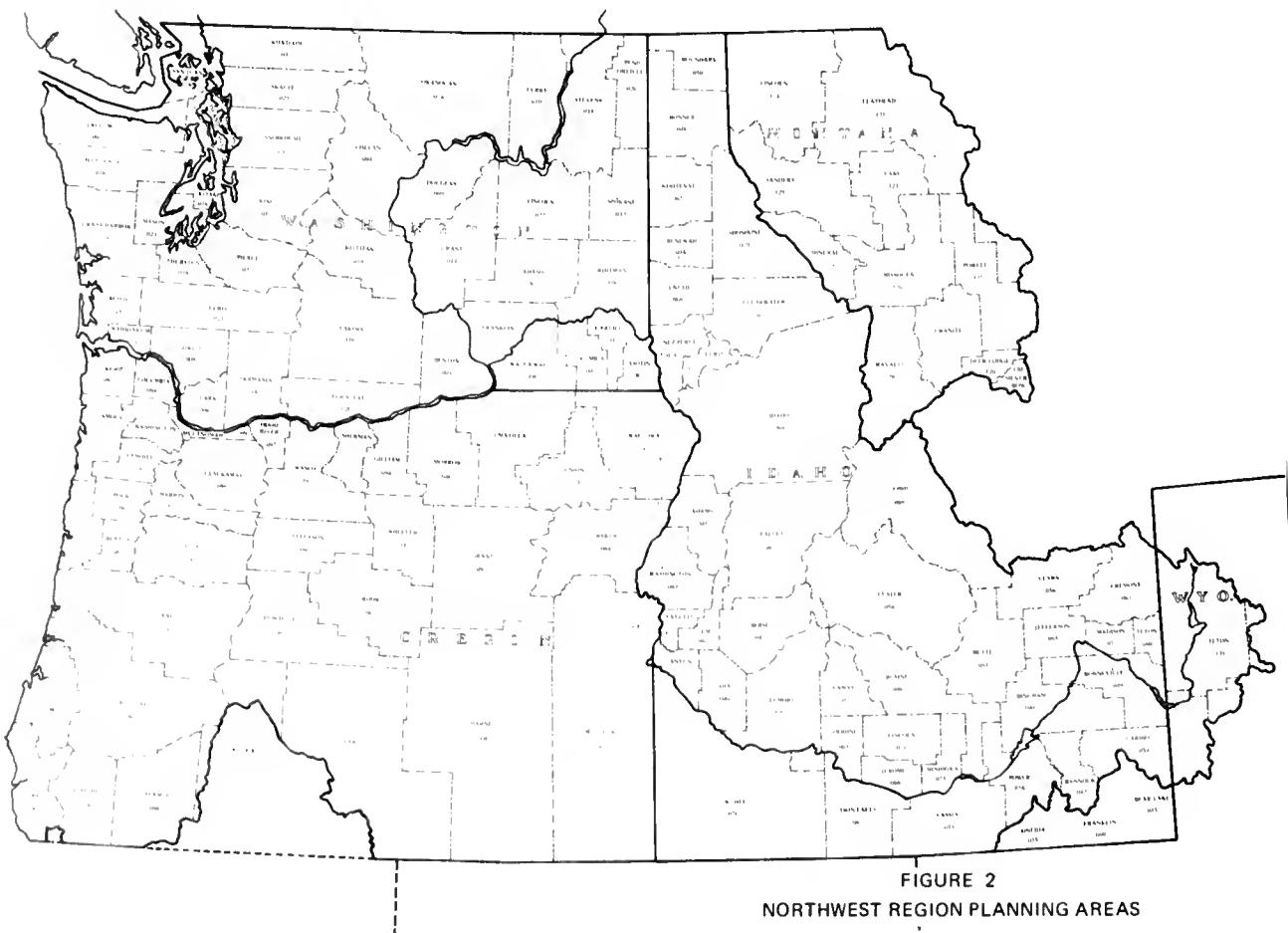


FIGURE 2  
NORTHWEST REGION PLANNING AREAS

## II. PROGRAM DESIGN



### A. BACKGROUND

Program design was viewed primarily as a process of developing a region-wide methodology for compiling and processing outdoor recreation data which would accomplish the data dependent objectives set forth earlier in this report (see Figure 3).

A first step was to inventory the data sources and the types of data which were available. The list of data was impressive, but its usefulness for regional planning purposes was severely restricted by a lack of standard terms and definitions. In order to have uniform terms to

THE DATA PROGRAM PROCESS

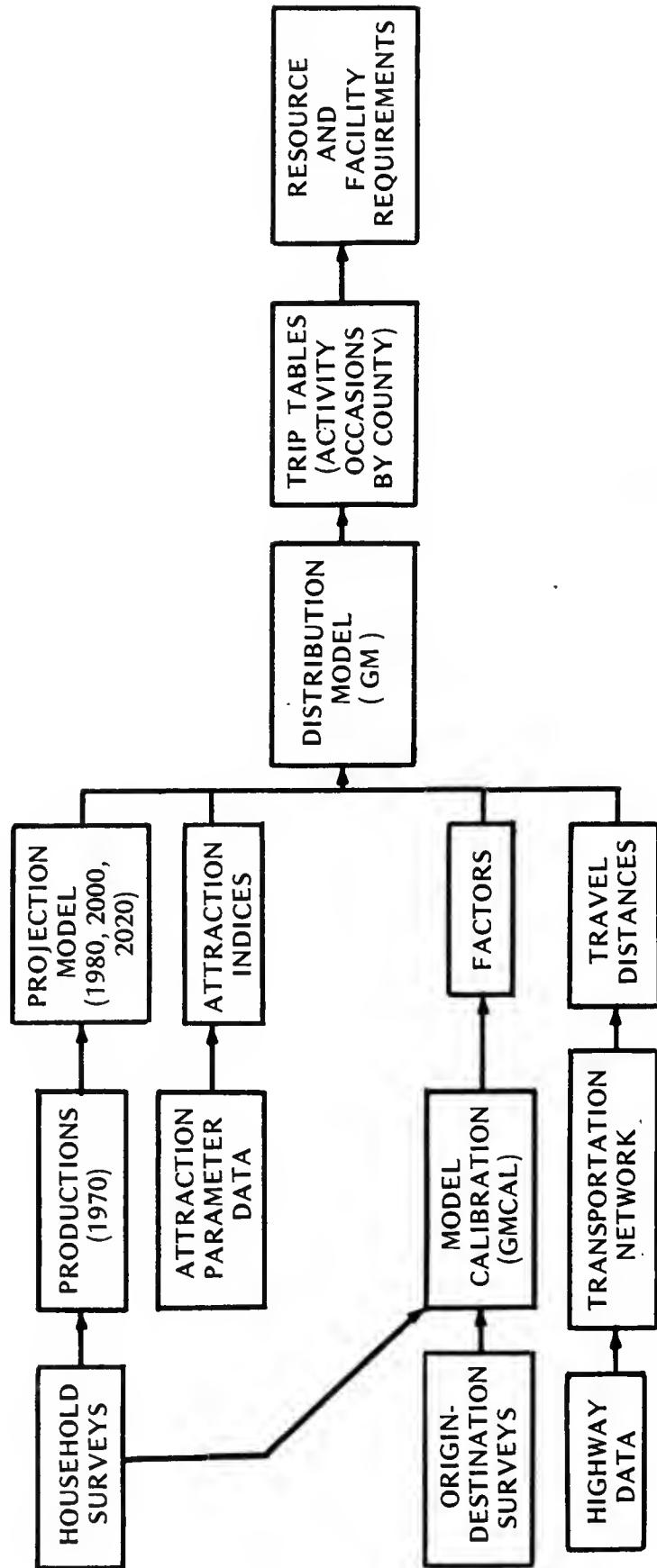


FIGURE 3

work with, it was necessary to convert terms measuring similar items into one standard term. Careful redefinitions and adjustments in terms were made, and standardization was achieved.

The data which was available had been collected over a considerable time span, for various purposes, by several agencies. Idaho, Oregon, and Washington, however, all had household survey information on recreation participation by activity collected as part of the SCORP process. These, however, did require adjustments to fit standardized activity definitions. Comparable data for the Montana and Wyoming counties was also obtained. Another common data source for the three states was camping origin-destination surveys for the respective state parks systems. The U. S. Forest Service's Rec-Zip program provided additional camping origin-destination data. In addition to these sources of data, each State had unique data that the other States did not have. Examples include: Idaho's in-depth analysis of its state park camping use, Montana's statewide resident recreation survey, Oregon's out-of-state tourist revenue studies, and Washington's trip length frequency information.

It was decided that the recreation participation information collected by the States would provide the productions, or the basic data for the study. Although productions are basic, an integral part of the program design is the methodology used to distribute productions to where the activity occurs. Allowances were incorporated into the distribution process for the effects that distance and relative attractiveness have

on participation. The distance versus participation information, together with attractiveness information, was used to distribute recreation participation from place of origin, either within or without the region, to place of destination. This was done for a base year (1970) and for three projection years (1980, 2000, and 2020).

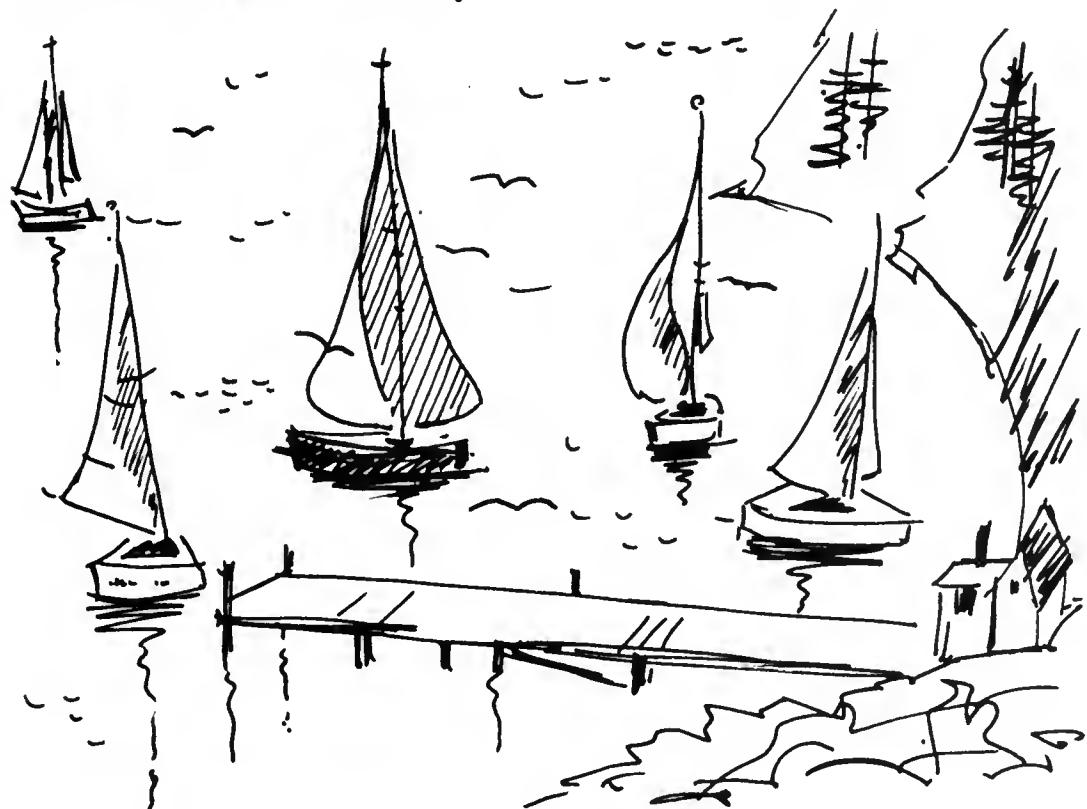
Projections of recreation participation were made by modifying the base year per capita use rate and multiplying the new rate by the projected population. All data was presented for the 16 recreation activities by county. Resource and facility requirements were estimated by means of conversion factors.

The desirability of using a computerized model to process the voluminous data involved was apparent. Once financing was assured, it was determined that a gravity modeling technique would best satisfy program needs.

A number of assumptions required in the program design are as follows:

1. The automobile would continue to be the primary mode of recreation transportation.
2. The relationship of the amount of participation to travel distance would remain constant through time.

3. Intrazonal travel distances, for those trips originating and ending within the same county, were assumed to be equal to one-half of the average travel distances to adjacent zones.
4. Present trends in per capita participation would continue throughout the time frame of this study.



#### B. DATA REQUIREMENTS AND PREPARATION

A great deal of data is needed as input to the gravity model. The data requirements and methods of preparing that data are described below:

##### 1. Standardization of Recreation Activities, Planning Areas, and Terms:

The first requirement of any study is that the data be clearly defined and consistent throughout. In this study, most of the data

had been collected prior to the establishment of the work group and in most instances was not uniform. It was necessary to aggregate, disaggregate, or modify data to make it uniform regionwide.

A total of 16 recreation activities were agreed to for use in this study. The activities are camping, picnicking, swimming, sightseeing and driving for pleasure, fishing, boating, water skiing, walking and hiking, hunting, playing outdoor games, bicycling, golfing, horseback riding, attending outdoor sporting/cultural events, participating in snow activities, and participating in other activities.

Definitions for each activity are set forth in Appendix A.

A county building block approach to planning areas was adopted for the study. Several methods of establishing geographic subunits of a state or region were available or are currently in use by member agencies; i.e., planning districts, river basins, individual project, ownership, etc. While no one selection of a standard area can accommodate everyone's purposes, it was agreed that counties were the best compromise. Planning areas outside of the region were states or groups of states. A complete list of planning areas is shown in Appendix B.

Numerous terms are used in recreation planning to explain more or less similar data sets. Recreation use is measured in at least half

a dozen different terms, and the same term may even be defined differently. In this study, recreation use is measured in terms of activity occasions. This term, along with other terms used in this report which require explanation, are defined in Appendix C.

## 2. Recreation Participation or Productions:

This term is defined as the annual activity occasions produced by residents of a certain area. This information was available for the counties of the region through the household surveys done in each State--specifics relating to the design and the findings of each survey is available in the respective State SCORP's. The data from each State survey was adjusted to fit the 16 activities of the program. Out-of-region areas' productions were limited to those which were imported into this region.

## 3. Trip Length Frequency and Origin-Destination Information:

Trip length frequency and origin-destination information are both important data sources in assessing the distribution of recreation use regionwide. Survey information on distance traveled to participate in the various recreation activities was collected as part of two household surveys: a national survey done by the University of Michigan, under contract to the Bureau of Outdoor Recreation, and a State of Washington Household Survey done by the Interagency Committee for Outdoor Recreation. Based on this information, distance

decay functions or curves have been developed for each activity (see Figures 4a and 4b). In addition, information with regard to the origins of visitors was collected at state park and U. S. Forest Service campgrounds regionwide.

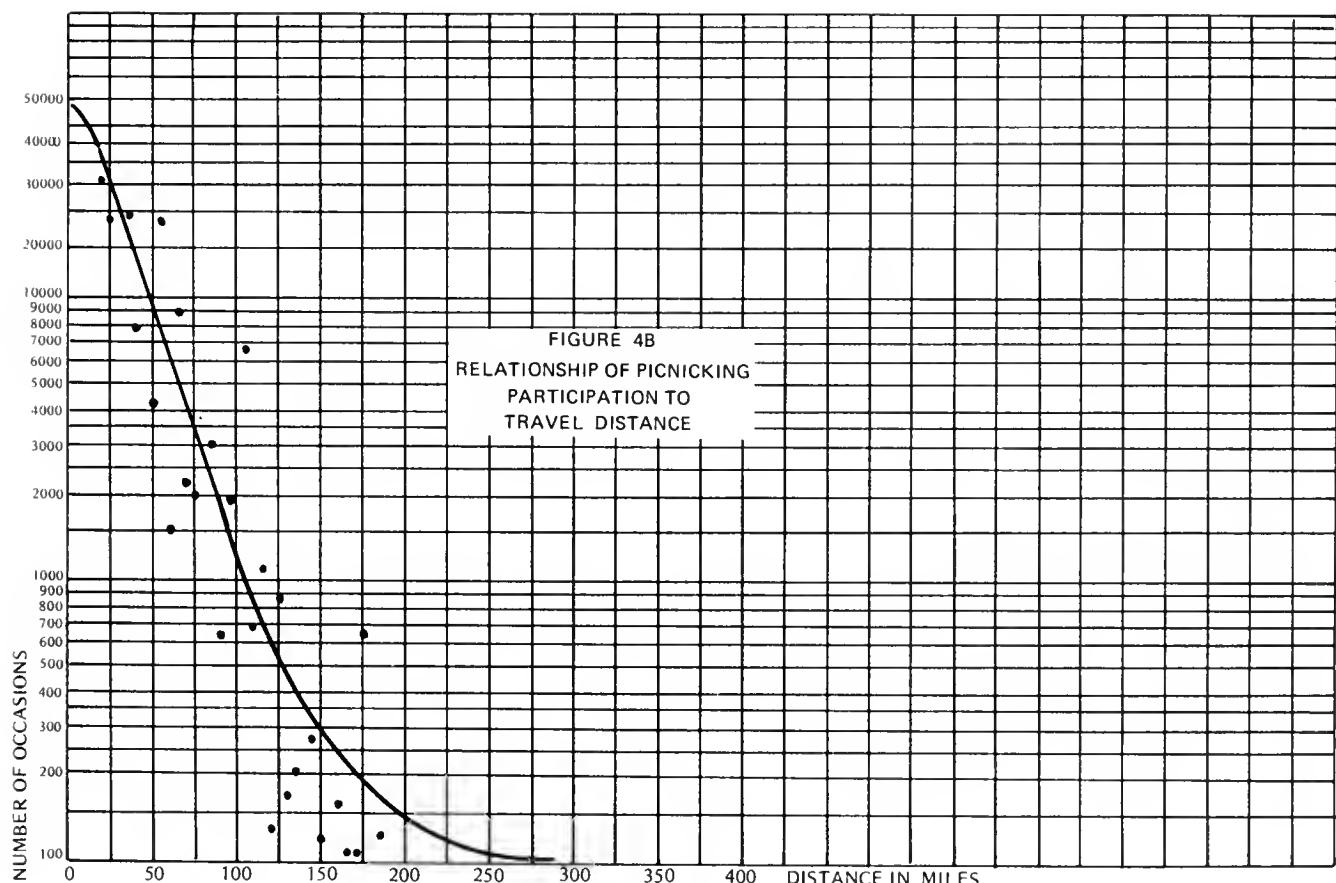
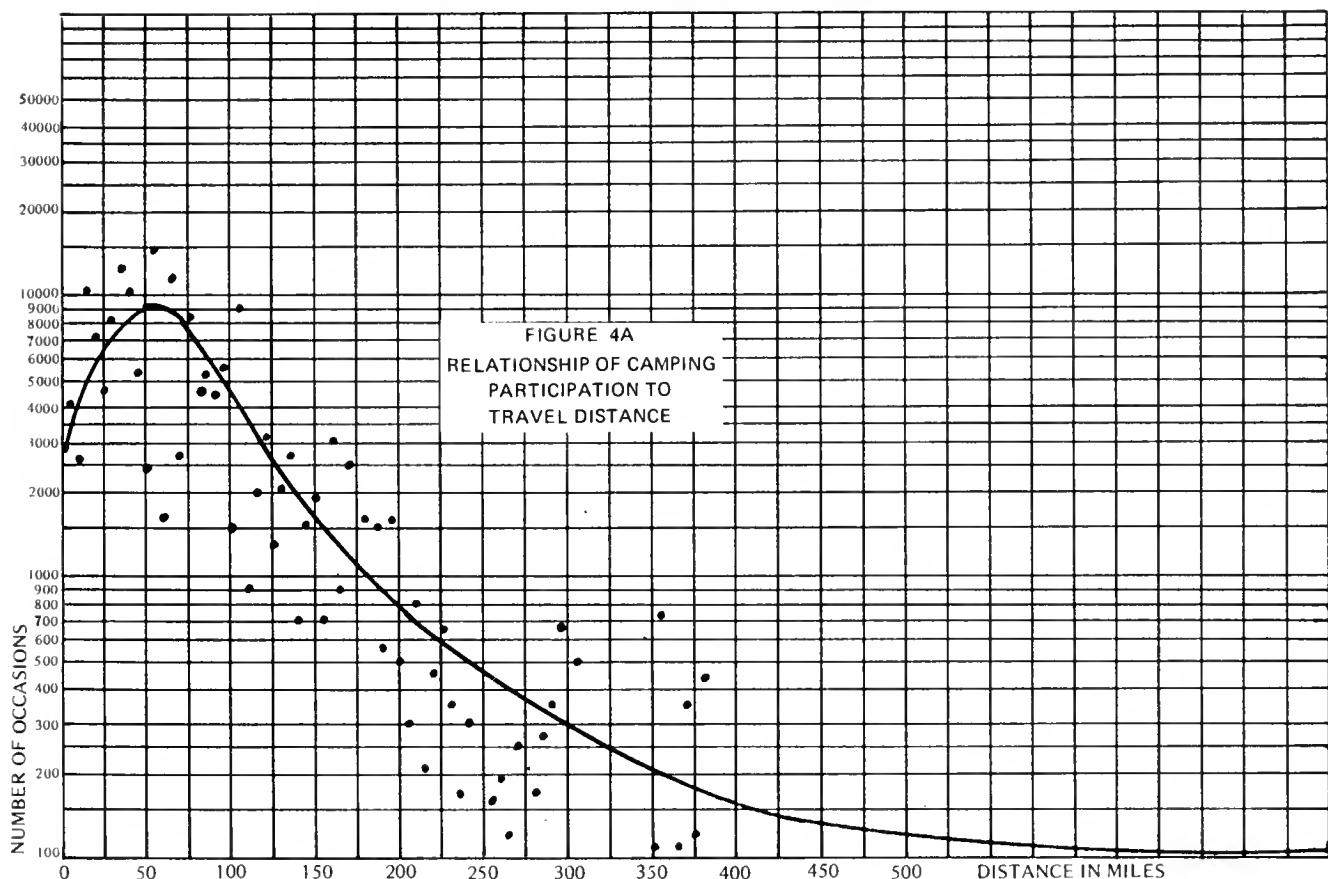
#### 4. Transportation Network:

Distance between counties were also necessary in order for recreation use to be distributed from where it is produced to where it takes place. The study utilized a computerized highway network which provided actual automobile travel distances between counties. Each county in the region is connected with every other county and with every external zone via the network (see Figure 5). The minimum path distance between each county and every other county and every external zone is produced by the network and used directly by the gravity model.

#### 5. Attractiveness Indices:

An attractiveness index was developed for each county in the region, for each of the activities. The purpose of the index is to provide, in the gravity model, a distributing effect tied to the relative suitability of counties to provide for or attract recreationists. An example of how this works is: Given an equal distance from county (x) to counties (a) and (b), the gravity model would distribute equal use to counties (a) and (b). However, inasmuch as county (a) is

# DISTANCE DECAY CURVES



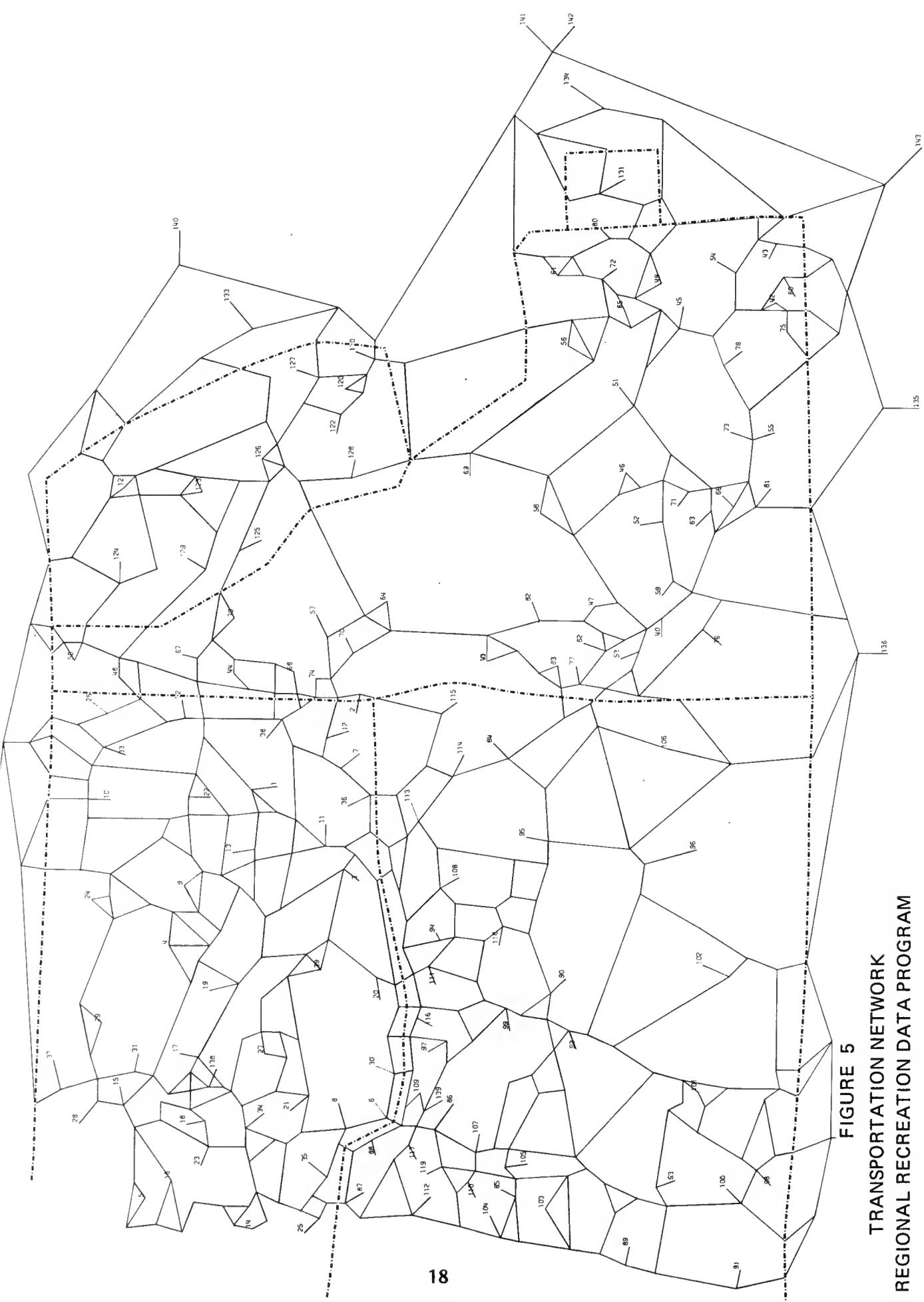


FIGURE 5  
TRANSPORTATION NETWORK  
REGIONAL RECREATION DATA PROGRAM

more attractive than county (b), the attractiveness index of county (a) is higher than that of county (b). As a result, output was weighted to distribute more use to county (a).



#### C. THE GRAVITY MODEL\*

A gravity model which is part of an Urban Transportation Planning IBM System 360 program battery, developed for the U. S. Department of Transportation, was chosen to distribute recreational trips in this program design.

This particular model was selected because of its flexibility in application, its ready availability at the Washington Department of Highways

\*Adapted from: Urban Transportation Planning General Information and Introduction to System 360, U. S. Department of Transportation, Federal Highway Administration, June 1970.

and because of their staff expertise in its application. It was also selected because it had the capacity for the large number of zones (144) and purposes (16) we wanted to process. Since the model is programmed for IBM 360 systems and is available from the Department of Transportation to any user, this application is not restricted to any one agency or computer.

The gravity model is one of the most widely used trip distribution techniques. The gravity model formulation is based upon the hypothesis that the trips produced at an origin and attracted to a destination are directly proportional to the total trip production at the origin, the relative attraction of the destination, and the distance between the origin and the destination. This relationship may be expressed as follows:

$$T_{ij} = P_i A_j F_{ij} \quad (1)$$

where

$T_{ij}$  = trips produced at  $i$  and attracted at  $j$ ;

$P_i$  = total trip production at  $i$ ;

$A_j$  = total trip attraction at  $j$ ;

$F_{ij}$  = calibration term for interchange  $ij$ ; based on distance;

$i$  = an origin zone number,  $i=1,2,\dots,n$ ;

$j$  = a destination zone number (same set of numbers used for  $i$ )

and  $n$  = number of zones.

These terms will be further amplified below since they are basic to much of what follows.

In the gravity model formulation, three separate parameters are required before the trip interchanges ( $T_{ij}$ ) can be computed. Two of the parameters, the number of trips produced, productions ( $P_i$ ) and the relative attractiveness, attractions ( $A_j$ ) of each zone in the study area, are related to the participation in recreation activities by the recreating public and to the potential suitability of the area for recreational use.

The other parameter ( $F_{ij}$ ) is a measure of the effect of distance on participation correlated to the respective distance between zones.

The gravity model distributes trips from production zone to attraction zone. The total distance between zones is the sum of the minimum path driving distance between zones obtained from the transportation network.

Travel distance factors ( $F_{ij}$ ) express the effect that spatial separation exerts on trip allocation. These factors measure the probability of tripmaking at each specified increment of distance. Some gravity models utilize a distance-decay formula to calculate the effect of distance. This model, in contrast, utilizes incremental values of ( $F$ ) and has the capability of accepting any form of a travel time versus participation relationship. It does not have to follow a mathematical function, but

within the transportation planning program battery is a calibration program that fits a smooth curve to the data by means of the least-squares technique.

The model also has the capacity for an additional adjustment factor (K) for extreme variations not explainable with the gravity model formula. The K-factors are applied to zone-to-zone interchanges to modify the gravity model formula. K-factors are used in this program to prevent the model from distributing trips between external zones.



#### D. PROJECTIONS

Projections of future recreation use require two additional sources of information; future population and future per capita use rates.

Projections of population were needed for each of the counties in the region, plus all of the external zones. It was decided to use Office of Business Economics-Economic Research Service series C population projections and use the ratio of county population to state total that had been developed by the Bonneville Power Administration.

Projections of future per capita use rates are dependent upon many factors. Historically, increasing leisure time, family income, and mobility have resulted in increasing per capita participation in most recreation pursuits. While recent events such as inflation, high unemployment, and the energy crisis may tend to influence these trends, it is believed that per capita participation will continue to rise in the future. However, while participation will increase, not all activities will share equally in the growth, and for this reason three separate per capita growth rates were chosen: stable, slow growth (30 percent increase by 2000), and rapid growth (70 percent increase by 2000). Activities were placed into each of these categories as follows:

<u>Stable</u>	<u>Slow Growth</u>	<u>Rapid Growth</u>
Hunting	Picnicking	Swimming
Fishing	Sightseeing & Driving for Pleasure	Boating
	Walking-Hiking	Water Skiing
	Horseback Riding	Playing Outdoor Games
	Camping	Golfing
	Attending Outdoor Sporting/Cultural Events	Bicycling
	Other Activities	Participating in Snow Activities



#### E. RESOURCE AND FACILITY REQUIREMENTS

A methodology was suggested for converting annual activity occasion estimates to resource and facility requirements. The method includes factors for rates of daily turnover, standards of facilities per user, acres per facility, and amount of use occurring on the average peak days.

Several assumptions were made relative to resource and facility requirements including:

1. Resource and facility requirements should be based on an average of peak days rather than absolute peak day.

2. A certain percentage of the people who participate in various activities will by choice (or other obscure reason) do so where there are no developed facilities for the activity.
3. For some recreation activities, a given facility can be used by more than one group or individual in any given day.
4. Development standards, in terms of facilities per acre or facilities per user, can and should vary depending on the policies of the administering organization.



### III. MODEL OUTPUT



#### A. THE DATA PACKAGE

One of the underlying objectives of the Regional Recreation Data Program is to produce data in a form that is readily understood and usable by individuals or agencies having a need for recreation data specific to the Northwest. The gravity model used has the capacity to output data in a variety of formats. Five sets of tables have been produced for a base year (1970) and each of three projection years (1980, 2000, and 2020).

The entire data package, including the projections, consists of approximately 1,600 pages of computer printouts. No attempt was made to include

the full data package in this report. Data used to generate this package are already in the process of being updated. When a significant amount of new data are made available, new runs will be made. Because of the timeliness of the data, a limited number of copies of the data package have been produced. For information regarding the most up-to-date output, please contact the Recreation Data Subcommittee, PNRBC.

A description of the five sets of tables follows:

1. A-Tables; Activity Information by County or Zone (16 tables - 1 for each activity, A-1 through A-16).

These tables are the most general of those produced. Summary information with respect to trips received and trips sent is presented for each of the 144 counties or zones (see Table 1 for example).

2. B-Tables; Camping Destination (Distribution) Information by County or Zone (144 tables - 1 for each county or zone, B-1 through B-144).

These tables provide detailed backup to Table A-1 (Camping). Information with respect to the destinations of campers originating in each of the 144 counties or zones is presented (an example of B-Tables and their use can be found in Section III, B-Tables 7 and 9).

TABLE 1 - EXAMPLE OF "A" TABLES

- SUMMARY OF TRIP ENDS -- PURPOSE NO.

1 - CAMPING  
TRIP TABLE SUMMARIES OF GM DEMAND SURVEY FOR ALL 16 ACTIVITIES

(1) ZONE	TRIPS FROM OTHER ZONES	(2) TRIPS TO OTHER ZONES	(3) TRIPS TO OTHER ZONES	(4) INTRAZONAL TRIPS	(5) TOTAL TRIPS RECEIVED (2) + (4)	(6) TOTAL TRIPS SENT (3) + (4)	(7) TOTAL TRIP ENDS (5) + (6)	00000380 (IN 100's)	
								TOTAL ACTIVITIES	TOTAL ACTIVITIES
1	295	103	1	296	104	243	400		
2	262	241	2	264	245	507			
3	6,150	406	19	6,155	413	2,180			
4	2,935	354	59	6,209	364	6,622			
5	1,293	1,463	43	2,978		3,342			
6	1,892	766	18	1,311	1,481	2,792			
7	1,981	774	2	894	78	972			
8	3,382	166	17	1,998	791	2,789			
9	708	119	1	383	167	550			
10	1,031	158	4	709	20	729			
11	1,563	150	1	1,035		1,197			
12	3,034	333	4	1,035		1,197			
13	3,975	513	32	1,035		1,197			
14	2,332	247	78	1,035		1,197			
15	3,273	97	14	1,035		1,197			
16	1,663	266	1,616	1,035		1,197			
17	1,348	341	88	1,035		1,197			
18	3,106	239	10	1,035		1,197			
19	857	137	2	1,035		1,197			
20	2,787	337	17	1,035		1,197			
21	1,973	80	3	1,035		1,197			
22	1,928	156	6	1,035		1,197			
23	2,883	223	35	1,035		1,197			
24	3,316	145	12	1,035		1,197			
25	842	32	843	1,035		1,197			
26	2,969	11,921	828	1,035		1,197			
27	2,993	35	828	1,035		1,197			
28	2,494	461	48	1,035		1,197			
29	4,784	63	4	1,035		1,197			
30	7,744	7,515	708	1,035		1,197			
31	6,687	14,613	428	1,035		1,197			
32	2,114	88	8	1,035		1,197			
33	1,239	588	10	1,035		1,197			
34	457	41	457	1,035		1,197			
35	983	258	7	1,035		1,197			
36	3,039	739	65	1,035		1,197			
37	654	656	12	1,035		1,197			
38	3,785	1,349	101	1,035		1,197			
39	758	7,934	244	1,035		1,197			
40				1,035		1,197			

3,426,600 annual camping activity occasions by residents of King County (17) Washington who leave their county of residence.

TABLE 1 (CONTINUED)

- SUMMARY OF TRIP ENDS -- PURPOSE NO. 1 - CAMPING  
 TRIP TABLE SUMMARIES OF GM DEMAND SURVEY FOR ALL 16 ACTIVITIES  
 00000380 (IN 100's)

(1) ZONE	TRIPS FROM OTHER ZONES	(3) TRIPS TO OTHER ZONES	(4) INTRAZONAL TRIPS	(5) TOTAL TRIPS RECEIVED		(6) TOTAL TRIPS SENT	(7) TOTAL TRIP ENDS
				(2) + (4)	(3) + (4)		
41	1,035	43		1,037	45	1,082	3,654
42	802	2,586	133	2,719	302	1,028	1,482
43	705	281	121	726	270	2,288	2,288
44	1,203	261	9	1,212	1,519		
45	1,723	1,473	46	1,769			
46	1,738	105	11	1,749	116	1,865	
47	2,714	115	13	2,727	128	2,855	
48	2,806	616	59	2,865	675	3,540	
49	1,392	2,852	223	1,615	3,075	4,690	
50	1,958	256	21	1,979	277	2,256	
51	882	167	9	891	176	1,067	
52	1,171	14	222	1,172	115	1,187	
53	1,487	244	19	1,709	4,466	6,175	
54	800	321	15	819	340	1,159	
55	902	329	15	917	344	1,261	
56	1,066	42	2	1,068	44	1,112	
57	1,153	449	23	1,176	472	1,648	
58	2,292	157	21	2,313	178	2,491	
59	2,554	1,128	146	2,700	1,274	3,974	
60	832	1,363	121	853	384	1,237	
61	1,449	485	38	1,487	523	2,010	
62	931	665	19	950	684	1,634	
63	500	172	3	503	175	678	
64	3,321	171	30	3,351	201	3,552	
65	735	678	19	754	697	1,451	
66	995	200	8	1,003	208	1,211	
67	2,350	1,447	87	2,437	1,534	3,971	
68	1,332	1,045	35	1,167	1,080	2,247	
69	1,303	303	31	1,334	334	1,668	
70	711	58	2	713	60	773	
71	703	60	2	705	62	767	
72	911	775	32	943	807	1,750	
73	679	308	10	689	318	1,007	
74	1,146	459	16	1,162	475	1,637	
75	1,635	143	6	1,641	149	1,790	
76	1,266	438	30	1,296	468	1,764	
77	1,902	878	26	1,928	904	1,832	
78	1,178	238	15	1,193	253	1,446	
79	2,543	802	54	2,592	856	3,453	
80	1,045	133	8	1,053	141	1,194	

TABLE 1 (CONTINUED)

ZONE	TRIPS FROM OTHER ZONES	TRIPS TO OTHER ZONES	TRIP TARIFF SUMMARY OF GM DEMAND SURVEY FOR ALL 16 ACTIVITIES			000000380 (IN 100's)
			(2)	(3)	(4)	
91	923	809	37	960	846	1,806
92	2,211	50	2,217	2,273		
93	2,493	116	496	615		
94	1,570	572	1,614	2,230		
95	1,956	2,535	2,008	2,587		
96	5,846	6,681	374	6,220	7,055	13,275
97	5,063	888	104	5,167	992	6,159
98	3,183	1,244	42	3,225	286	4,511
99	2,787	2,906	399	3,186	305	6,491
90	2,065	373	21	2,086	394	2,480
91	2,378	673	88	2,466	761	3,227
92	3,759	1,678	174	3,933	852	5,785
93	3,540	3,752	427	3,967	179	8,146
94	1,217	118	5	1,222	123	1,345
95	1,516	333	28	1,544	361	1,905
96	910	367	19	929	386	1,315
97	3,510	866	47	3,557	913	4,470
98	2,465	2,817	334	2,799	151	5,950
99	2,670	336	32	3,702	368	4,070
100	2,415	1,390	131	2,546	1,521	4,067
101	3,113	2,445	238	3,351	683	6,034
102	1,541	1,152	17,166	1,550	161	1,711
103	4,358	17,166	1,067	5,954	762	24,716
104	6,007	3,736	3,116	6,198	2,558	7,456
105	2,736	84	84	2,820	200	6,020
106	833	985	57	890	1,042	1,932
107	4,555	7,112	350	4,905	7,462	12,367
108	1,220	2,295	13	1,233	308	1,541
109	2,074	25,264	557	2,631	821	28,452
110	2,804	1,202	334	2,838	236	4,074
111	2,032	71	3	2,035	74	2,109
112	4,717	737	82	4,799	819	5,618
113	1,434	3,896	179	1,613	75	5,688
114	1,945	1,035	78	2,023	113	3,136
115	2,438	210	27	2,465	237	2,702
116	2,819	941	41	2,860	982	3,842
117	1,857	7,015	129	1,986	144	9,130
118	1,775	7,777	5	1,780	82	1,862
119	2,844	1,608	40	2,884	648	4,532
120	1,241	320	20	1,261	340	1,601

159,600 annual camping activity occasions by Lane County (103) residents who camp within their county of residence

TABLE 1 (CONTINUED)

- SUMMARY OF TRIP FENDS -- PURPOSE NO. 1 - CAMPING  
 TRIP TABLE SUMMARIES OF GM DEMAND SURVEY FOR ALL 16 ACTIVITIES 000000380 (IN 100's)

1 ZONE	2 TRIPS FROM OTHER ZONES	3 TRIPS TO OTHER ZONES	4 INTRAZONAL TRIPS	5 TOTAL TRIPS RECEIVED (2) + (4)	6 TOTAL TRIPS SENT (3) + (4)	7 TOTAL TRIP ENDS (5) + (6)
				TRIPS FROM OTHER ZONES	INTRAZONAL TRIPS	TRIPS RECEIVED (2) + (4)
121	2,464	866	158	2,622	1,024	3,646
122	1,726	101	9	1,735	110	1,845
123	2,225	591	82	2,307	673	2,980
124	1,592	630	71	1,663	701	2,364
125	1,569	77	5	1,574	82	1,656
126	1,751	2,464	208	1,959	2,672	4,631
127	1,328	1,155	10	1,338	1,655	1,503
128	1,667	634	67	1,734	701	2,435
129	1,225	210	17	1,242	227	1,469
130	935	2,165	109	1,044	2,274	3,318
131	2,582	38	10	2,592	48	2,640
132	1,701	3,303		1,701	3,303	5,004
133	479	3,633		479	3,633	842
134	472	182		472	182	654
135	577	3,042		577	3,042	3,619
136	692	382		692	382	1,074
137	1,012	20,862		1,012	20,862	21,874
138	116	891		116	91	207
139	135	67		135	67	202
140	563	1,867		563	1,867	2,430
141	525	1,891		525	1,891	2,416
142	507	865		507	865	1,372
143	507	473		507	473	1,980
144	648	1,646		648	1,646	2,294
TOTAL	261,713	261,713		12,896	274,609	274,609

227,400 total annual camping activity occasions by residents of Silver Bow County (130) Montana

104,400 total annual camping activity occasions occurring within Silver Bow County (130) Montana

3. C-Tables; Boating Destination (Distribution) Information by County or Zone (144 tables - 1 for each county or zone, C-1 through C-144).

These tables provide detailed backup to Table A-6 (Boating). Information with respect to the destinations of boaters originating in each of the 144 counties or zones is presented (see Table 2 for example).

4. D-Tables; Camping Origin Information by County or Zone (144 tables - 1 for each county or zone, D-1 through D-144).

These tables provide detailed backup to Table A-1 (Camping). Information with respect to the origins of campers coming to each of the 144 counties or zones is presented (an example of D-Tables and their use can be found in Section III, B-Tables 8 and 10).

5. E-Tables; Boating Origin Information by County or Zone (144 tables - 1 for each county or zone, E-1 through E-144).

These tables provide detailed backup to Table A-6 (Boating). Information with respect to the origins of boaters coming to each of the 144 counties or zones is presented (see Table 3 for example).

**TABLE 2**  
**EXAMPLE OF "C" TABLES**

Print Boating Trip Table

(All Numbers In 100's)

6/19/75

Table 1 From Zone 32 To All Other Zones (Abs. Total = 7886)

Zone	00	1	2	3	4	5	6	7	8	9
0	—	91	29	44	33	9	3	8	6	78
10	26	52	19	112	9	3	4	24	8	11
20	20	5	166	6	44	6	148	15	12	9
30	9	9	3316	155	5	1	15	10	274	12
40	9	9	4	10	309	5	5	9	308	8
50	69	6	5	9	5	5	6	30	7	11
60	5	7	9	5	22	6	5	902	30	6
70	10	5	6	4	59	5	8	8	6	500
80	6	5	11	9	12	2	11	4	3	5
90	9	7	10	12	10	10	9	1	11	6
100	4	10	12	13	11	6	11	8	12	2
110	4	15	2	23	17	18	5	2	6	3
120	3	25	12	22	40	44	30	10	12	35
130	1	9	12	6	6	6	7	—	—	1
140	6	6	6	7	—					

90,200 annual activity occasions of boating from Spokane County (32) to Kootenai County (67)

**TABLE 3**  
**EXAMPLE OF "E" TABLES**

Rebuild Trips and Print Boating

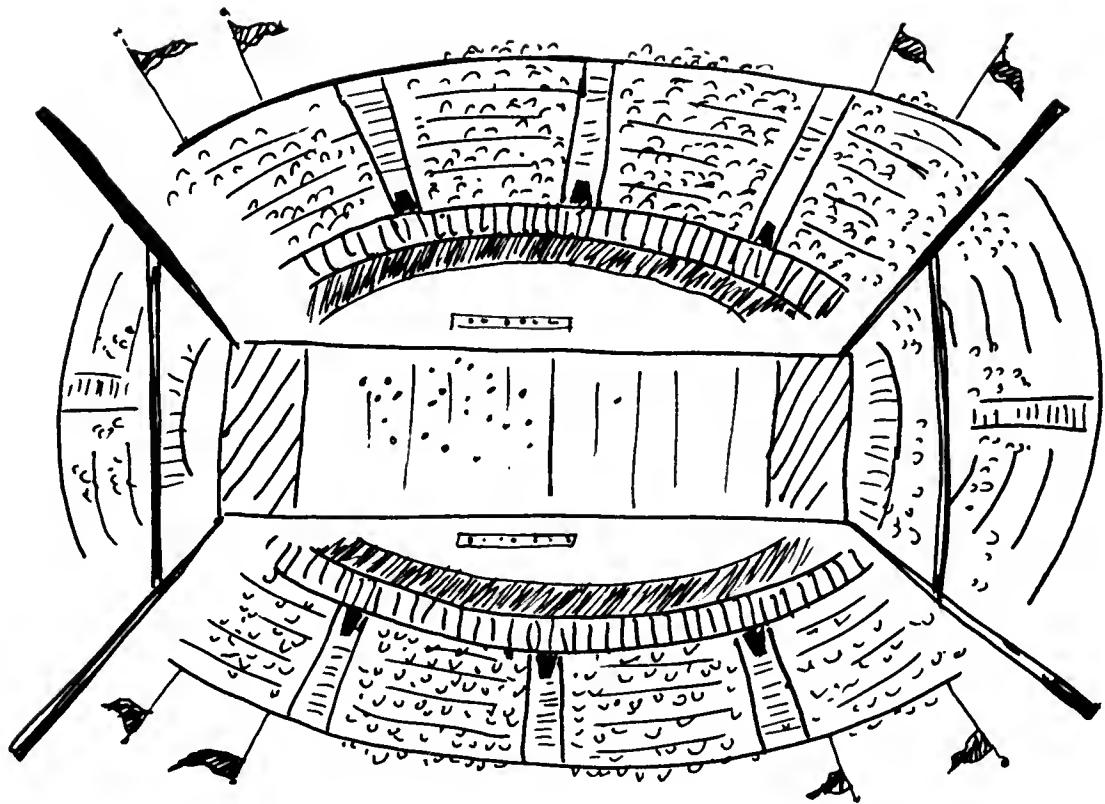
(All Numbers In 100's)

6/19/75

Table 6 To Zone 67 From All Other Zones (Abs. Total = 2472)

Zone	00	1	2	3	4	5	6	7	8	9
0	—	7	—	2	1	2	—	—	—	1
10	1	1	—	4	3	2	—	59	1	—
20	—	2	7	—	4	—	4	10	—	1
30	—	7	902	5	2	—	1	1	11	5
40	7	—	—	—	6	1	—	—	34	—
50	2	—	—	3	—	—	—	2	1	2
60	—	—	—	—	1	—	—	889	18	—
70	1	1	—	—	2	—	1	1	—	298
80	—	1	—	—	1	1	—	—	—	9
90	—	1	1	5	—	1	—	—	2	—
100	2	4	1	10	2	1	3	1	—	—
110	1	—	3	2	1	1	—	—	—	—
120	—	1	—	2	2	—	8	—	—	—
130	—	—	25	3	2	17	2	—	1	—
140	16	14	6	3	—					

29,800 annual activity occasions of boating occurring in Kootenai (67) by Shoshone County (79) residents.



## B. A CASE EXAMPLE

While Section III, A. described the data package in general terms, this section provides specific examples of how the data can be used. For the example, two counties have been chosen: Spokane County, Washington, and Kootenai County, Idaho. These adjacent counties provide a large number of trip interchanges across state boundaries and examples of recreation use and travel patterns to and from both an urbanized county (Spokane) and a resource county (Kootenai).

Tables 4 and 5 are composites by county from A-tables as described in Section III, A. The tables are basically the same format as A-tables

**TABLE 4**  
**"A" TABLE SUMMARY - Spokane County**  
(All Numbers in 100's)

(1)	(2)	(3)	(4)	(5)	(6)
Purpose	Trips From Other Zones	Trips To Other Zones	Intrazonal Trips	Total Trips Received (2) + (4)	Total Trips Sent (3) + (4)
1 Camping	687	14613	428	1115	15041
2 Picnicking	643	1757	2194	2837	3951
3 Swimming	402	4338	16675	17077	21013
4 Sightseeing	3922	17095	6985	10907	24080
5 Fishing	501	2297	2634	3135	4931
6 Boating	175	4570	3316	3491	7886
7 Water Skiing	92	1009	457	549	1466
8 Walking	569	12040	4985	5554	17025
9 Hunting	241	1003	320	561	1323
10 Outdoor Games	945	482	2654	3599	3136
11 Bicycling	912	2659	24948	25860	27607
12 Golfing	206	752	4025	4231	4777
13 Horseback Riding	87	1884	2277	2364	4161
14 Attending Events	415	1730	5301	5716	7031
15 Snow Activities	634	2596	971	1605	3567
16 Other Activities	985	56	2	987	58

**TABLE 5**  
**"A" TABLE SUMMARY - Kootenai County**  
(All Numbers in 100's)

(1)	(2)	(3)	(4)	(5)	(6)
Purpose	Trips From Other Zones	Trips To Other Zones	Intrazonal Trips	Total Trips Received (2) + (4)	Total Trips Sent (3) + (4)
1 Camping	2350	1447	87	2437	1534
2 Picnicking	1764	2085	1577	3341	3662
3 Swimming	1686	2630	2493	4179	5123
4 Sightseeing	5629	2236	1064	6693	3300
5 Fishing	1463	1318	1236	2699	2554
6 Boating	1583	950	889	2472	1839
7 Water Skiing	445	250	210	655	460
8 Walking	2718	2002	1290	4008	3292
9 Hunting	355	517	198	553	715
10 Outdoor Games	875	1862	1727	2602	3589
11 Bicycling	1937	5338	5109	7046	10447
12 Golfing	262	301	277	539	578
13 Horseback Riding	455	380	343	798	723
14 Attending Events	426	2366	846	1272	3212
15 Snow Activities	1098	1769	696	1794	2465
16 Other Activities	805	2635	103	908	2738

except all purposes (activities) for Spokane and Kootenai Counties have been listed on the respective tables. The following types of analyses may be made:

1. Total activity occasions occurring in the county are:

Camp	Picnic	Swim	P1. Dr. & Sightseeing
<u>Spokane:</u>			
111,500	283,700	1,707,700	1,090,700
<u>Kootenai:</u>			
243,700	334,100	417,900	669,300

2. Total activity occasions produced in the county are:

Camp	Picnic	Swim	P1. Dr. & Sightseeing
<u>Spokane:</u>			
1,504,100	395,100	2,101,300	2,408,000
<u>Kootenai:</u>			
153,400	366,200	512,300	330,000

These types of analyses can be done for each of the 16 purposes.

Analysis could also be made in the following manner:

1. Over 97 percent of the camping produced in Spokane County is distributed to other zones.

2. Over 96 percent of camping use in Kootenai County comes from other zones.
3. Approximately 55 percent of the picnicking produced in Spokane County stays in the county.
4. Nearly 80 percent of the swimming produced in Spokane County stays in the county.
5. Nearly 65 percent of the boating use in Kootenai County comes from other zones.

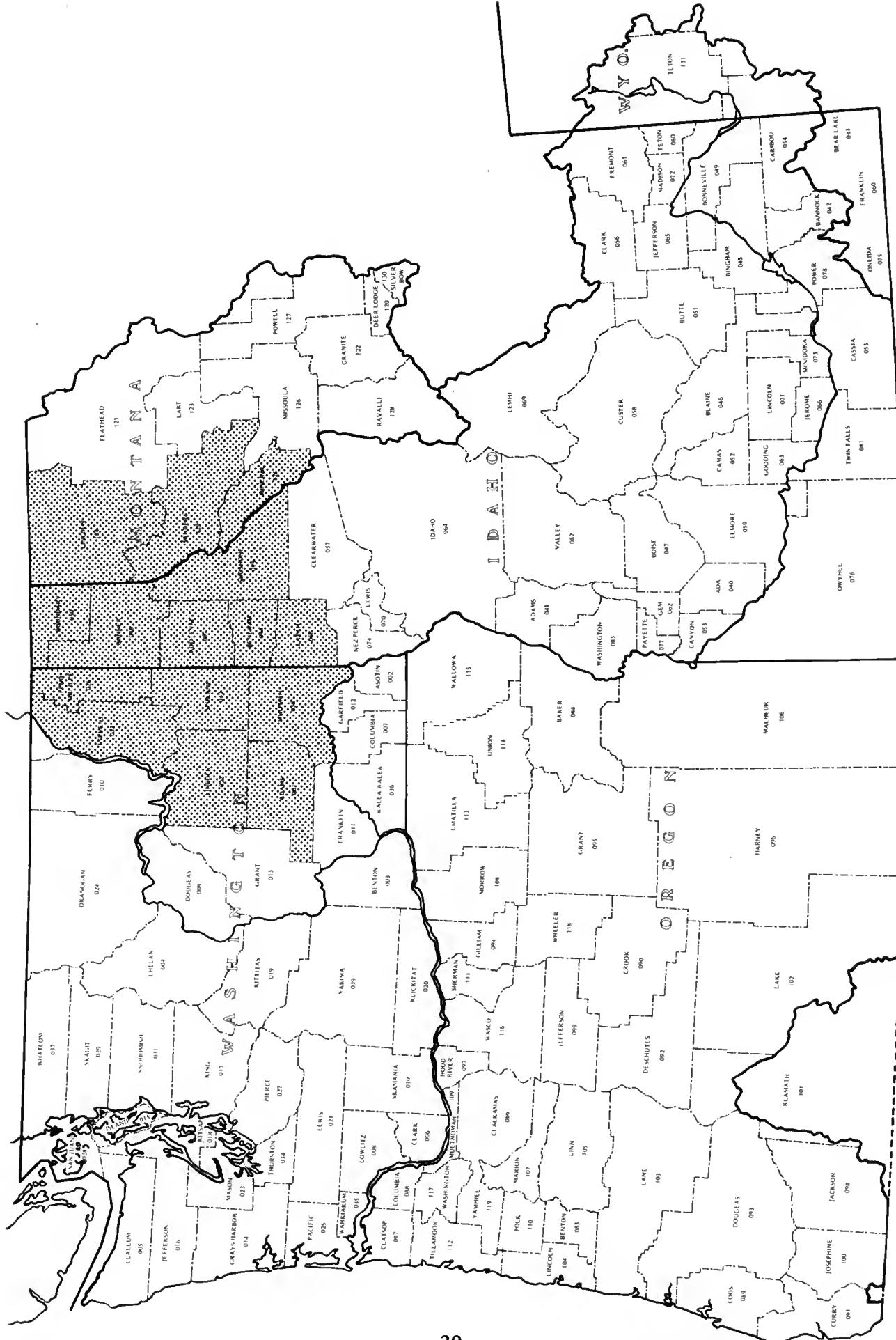
This type analysis can also be done for each of the 16 activities.

General statements regarding each recreation activity can be made:

1. Bicycling is the most popular activity among residents of Spokane County and most of this activity stays in the county.
2. More trips come into Kootenai County for purposes of sightseeing and pleasure driving than for any other recreation purpose.

A considerably more in-depth analysis of recreation use and travel patterns can be made through use of camping origin and destination information generated by the program. A hypothetical study area involving 15 counties in three states illustrates (see Figure 6 and Table 6).

FIGURE 6  
LOCATION OF CASE EXAMPLE



**TABLE 6**  
**CASE EXAMPLE—CAMPING ORIGINS AND DESTINATIONS**

COUNTY	ZONE NUMBER	1970 POPULATION	ATTRACTION INDEX	ORIGIN PRODUCTION (Activity Occasion)	DESTINATION PARTICIPATION (Activity Occasion)
Adams	01	12,014	1	10,400	29,600
Lincoln (WA)	22	9,572	3	8,300	97,600
Pend Oreille	26	6,025	3	3,300	84,300
Spokane	32	287,487	3	1,504,100	111,500
Stevens	33	17,405	8	9,600	212,200
Whitman	38	37,900	2	66,800	66,600
Benewah	44	6,230	4	27,000	121,200
Bonner	48	15,560	10	67,500	286,500
Boundary	50	5,484	8	27,700	197,900
Kootenai	67	35,332	7	153,400	243,700
Latah	68	24,891	4	108,000	116,700
Shoshone	79	19,718	8	85,600	259,700
Lincoln (MT)	124	18,063	8	70,100	166,300
Mineral	125	2,958	6	8,200	157,400
Sanders	129	7,093	6	22,700	124,200

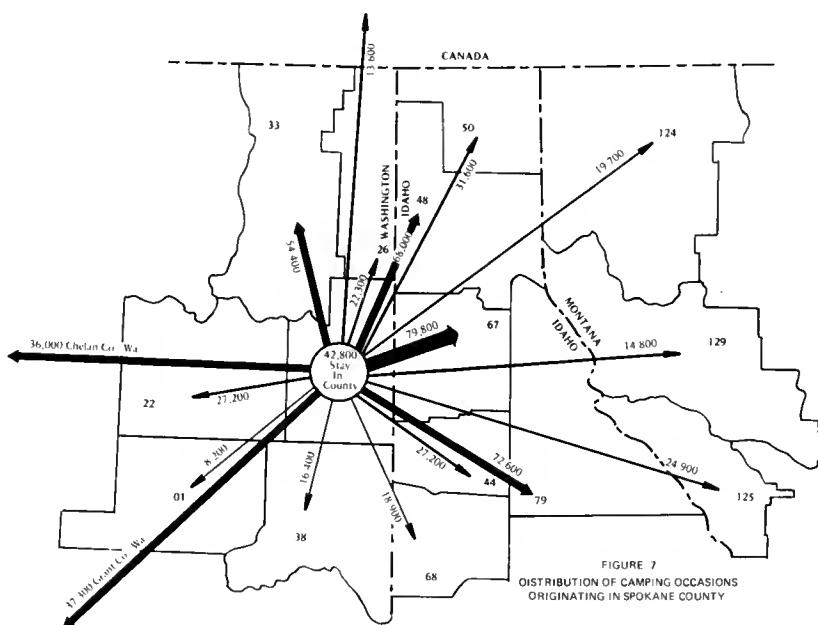
Tables 7 through 10 and Figures 7 through 10 pull data on Spokane and Kootenai Counties and the other surrounding zones from B-Tables and D-Tables. For this example, camping data only are used; however, the same kind of analysis could be done for boating from C-Tables and E-Tables.

Each table will be analyzed separately.

Table 7 shows the number of trips FROM SPOKANE COUNTY to all other zones. Note the relationship between this table and Table 1. The absolute (ABS) total of Table 7 is equal to "total trips sent" of Table 1 for zone 32.

**TABLE 7 (B-32)**  
**DISTRIBUTION OF CAMPING – SPOKANE COUNTY (ZONE 32)**  
 (In 100's)

From Zone 32 To All Other Zones (Abs. Total = 1504100)										
ZONE	00	1	2	3	4	5	6	7	8	9
0	—	82	39	146	360	97	22	95	31	41
10	105	105	74	373	125	70	106	85	37	100
20	30	58	272	49	321	82	223	100	39	109
30	93	93	428	544	26	9	74	98	164	156
40	25	68	29	26	272	23	62	104	680	50
50	316	34	42	46	26	28	42	133	117	77
60	26	55	27	15	321	23	29	798	189	82
70	83	22	31	21	189	20	39	29	35	726
80	35	29	117	23	78	27	93	118	49	64
90	58	58	100	64	62	66	37	86	52	103
100	46	62	43	84	116	37	33	68	63	44
110	36	71	100	97	113	208	81	33	74	39
120	82	185	119	178	197	249	197	93	140	148
130	64	98	136	35	33	32	32	47	5	4
140	39	39	39	32	30					

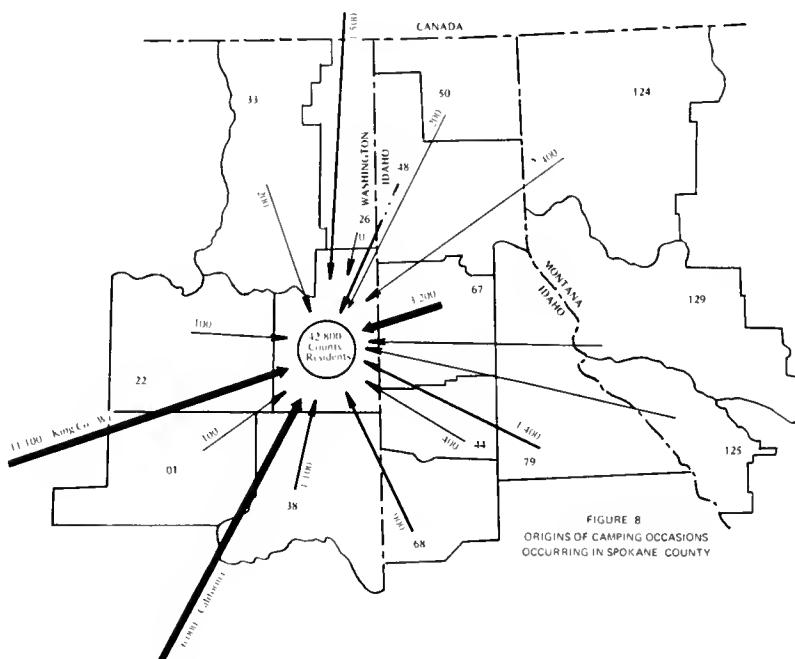


Analysis reveals that campers from Spokane County have a significant impact in many of the 144 zones. However, about 35 percent of the total use is distributed to the 18 counties or zones shown in Figure 7.

Table 8 shows the number of trips TO SPOKANE COUNTY from all other zones. Note that ABS total is equal to the "total trips received" of Table 1 for zone 32.

**TABLE 8 (D-32)**  
**ORIGINS OF CAMPING – SPOKANE COUNTY (ZONE 32)**  
 (In 100's)

To Zone 32 From All Other Zones (Abs. Total = 1115)										
ZONE	00	1	2	3	4	5	6	7	8	9
0	—	1	2	2	2	1	2	—	1	1
10	—	1	—	3	1	1	—	111	8	1
20	—	—	1	—	2	1	—	35	—	1
30	1	20	428	2	1	—	2	2	11	5
40	15	—	5	1	4	3	—	—	9	5
50	2	—	—	8	—	1	—	2	—	2
60	1	1	1	1	1	1	—	32	9	1
70	—	—	2	—	5	1	1	2	—	14
80	1	1	1	1	2	4	11	2	2	6
90	—	2	3	7	—	1	1	2	5	1
100	2	4	—	28	2	5	3	12	1	39
110	2	—	1	16	3	1	2	11	—	2
120	1	4	—	3	4	—	13	—	3	1
130	7	—	15	1	—	9	1	60	1	—
140	7	7	3	2	5					



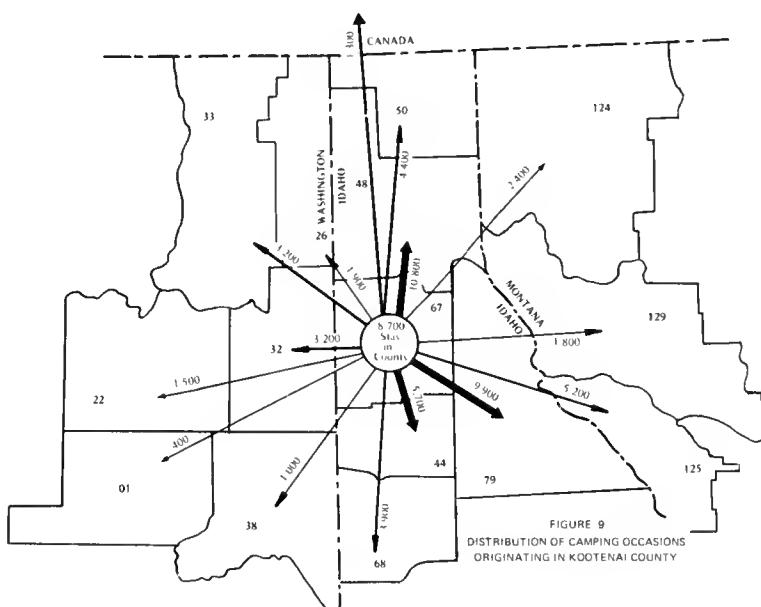
Analysis reveals that not all zones impact Spokane County; in fact, almost 40 percent of the camping comes from within county. Another 25 percent comes from the 18 counties or zones shown in Figure 8.

Table 9 shows the number of trips FROM KOOTENAI COUNTY to all other zones. The ABS total is equal to the "total trips sent" of Table 1 for zone 67.

**TABLE 9 (B-67)**  
**DISTRIBUTION OF CAMPING — KOOTENAI COUNTY (ZONE 67)**  
 (In 100's)

From Zone 67 To All Other Zones (Abs. Total = 1534)

ZONE	00	1	2	3	4	5	6	7	8	9
0	—	4	3	11	28	9	1	7	3	3
10	7	8	5	25	11	6	10	7	3	8
20	2	6	15	4	24	7	19	9	3	9
30	9	9	32	32	2	1	5	10	10	12
40	2	7	3	2	57	2	7	9	108	6
50	44	4	4	4	2	3	5	11	13	7
60	3	5	3	1	28	3	2	87	39	9
70	7	2	4	2	15	2	3	3	4	99
80	4	3	10	2	7	2	9	10	4	6
90	5	5	9	6	5	6	3	7	5	10
100	4	6	4	7	11	4	3	5	5	4
110	3	7	8	8	9	18	7	3	6	3
120	10	21	15	22	24	52	31	12	18	18
130	8	10	13	4	3	3	3	4	1	—
140	4	4	4	4	3					



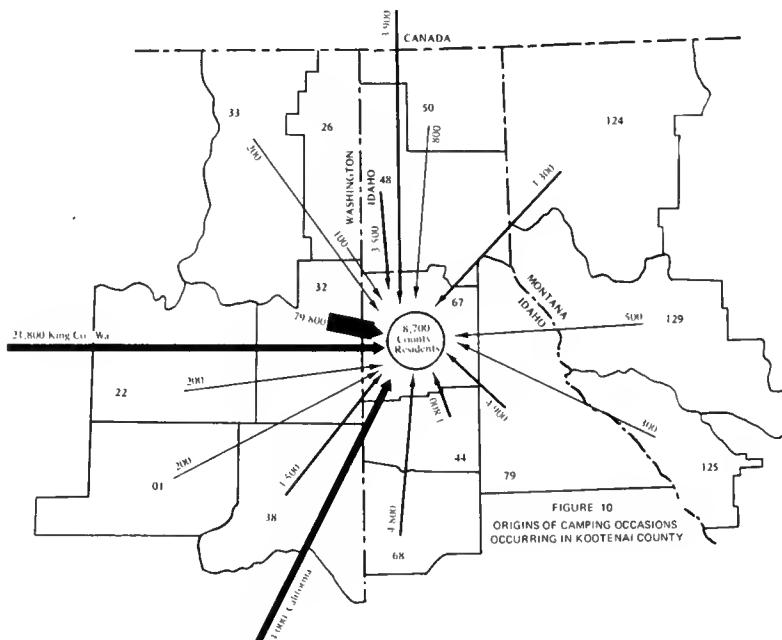
Campers from Kootenai County have an impact in nearly all zones. However, over 42 percent of the total camping use either stays in county or is distributed to the 16 counties or zones shown in Figure 9.

Table 10 shows the number of trips TO KOOTENAI COUNTY from all other zones. The ABS total is equal to the "total trips received" of Table 1 for zone 67.

TABLE 10 (D-67)  
ORIGINS OF CAMPING – KOOTENAI COUNTY (ZONE 67)  
(In 100's)

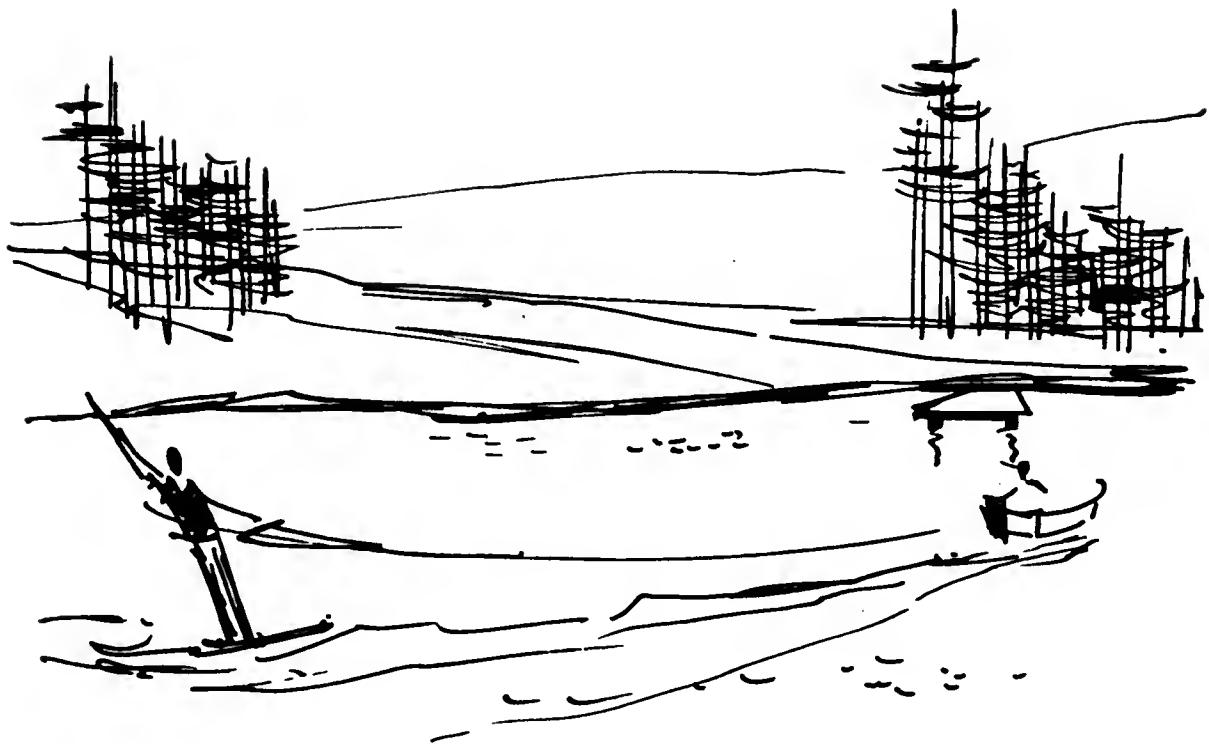
To Zone 67 From All Other Zones (Abs. Total = 2437)

ZONE	00	1	2	3	4	5	6	7	8	9
0	—	2	4	4	4	2	4	1	3	2
10	1	2	1	5	3	1	1	218	17	1
20	1	1	2	—	3	—	1	72	—	3
30	—	47	798	2	3	—	3	5	15	10
40	35	1	13	1	18	7	1	1	35	14
50	8	1	—	19	1	1	—	5	1	5
60	2	2	3	1	2	3	1	87	48	2
70	1	—	4	1	8	1	2	4	1	49
80	1	4	—	1	4	8	24	3	4	13
90	2	4	7	16	1	2	2	4	14	2
100	7	11	1	61	4	10	6	23	2	86
110	4	—	3	30	8	3	4	23	1	5
120	3	10	1	7	13	3	51	2	10	5
130	21	—	39	4	1	22	3	140	1	—
140	18	19	9	4	12					



Nearly all zones impact Kootenai County. However, despite this, nearly 55 percent of the use can be attributed to the 18 zones which are shown in Figure 10.

#### IV. PROGRAM LIMITATIONS



This model's limitations can be divided into two categories: limitations due to inherent deficiencies of gravity theory models, and limitations in the output due to problems associated with this application; most of these stem from deficiencies in the input data.

##### A. MODEL DEFICIENCIES

Even though the gravity model used was very flexible, there were some deficiencies that could not be corrected or entirely compensated for.

1. The most significant deficiency was that the effect of incremental distance and attractiveness remained the same regardless of the place

of origin. It was initially felt that distance and attractiveness would be adequate parameters on which to calibrate the model. The assumption was that the effect of distance remains the same regardless of the place of origin. It now appears that the relative effect of distance varies considerably by place of origin. Likewise, attractive destinations for people in one place are not the same as for people living in a completely different place; the attractiveness of the mountains is not so attractive to somebody that lives near other mountains as to a person that lives many miles away from any mountains.

2. Another deficiency was that the scope of this program, due to data and gravity model limits, does not lend itself to determining travel patterns within counties. It is only reliable for the distribution of participation to and from counties.

These inherent gravity model deficiencies could possibly be eliminated with a systems model. A systems model was not used in this Northwest example for several reasons:

- Lack of expertise to build the complex model that would be required.
- Lack of adequate and reliable data with which the model could be calibrated.
- Question of cost versus value of end product.



#### B. LIMITATIONS OF THIS APPLICATION

1. No attempt was made to compensate for the restriction on recreation traffic flow caused by state boundaries. It was felt that state lines do tend to restrict the distribution of recreation trips more than other political boundaries such as county lines. This may be especially significant for hunting and fishing where out-of-state licenses are required. The model does have the capability for this kind of adjustment, but reliable data could not be obtained on which to base such an adjustment.
2. It was not possible to completely normalize the participation data between the respective States, even though it was recognized that because of different sampling methods, different survey dates, etc., significant variations existed in the data between the States. This

can be corrected, in the future, by following consistent and concurrent survey procedures regionwide.

3. The study was limited to the use of existing data, and the inherent deficiencies of that data limit the ways the output data can be used.
4. It was necessary to make test runs of the model to check the attraction values. Some discrepancies were found and most of these were traced back to uncertain data and decisions being incorporated into the attraction values. The distributions that were achieved after making various adjustments appeared to be within reasonable tolerances.
5. It was not possible, because of data limitations, to consider the effect that future recreation developments, energy requirements and transportation system changes may have on the relationship of distance to participation in recreation activities.

## V. RECOMMENDATIONS



In consideration of the continuing regional need for uniform recreation data, the following recommendations are made:

1. That a regionwide coordinated approach to recreation data gathering and processing be continued as a function of an interagency planning group, the Recreation Data Subcommittee.
2. That the membership of the Recreation Data Subcommittee be expanded to include the active participation of all major recreation agencies in the Northwest, including, but not limited to, the Bureau of Outdoor

Recreation, Idaho State Parks and Recreation Department, Montana Department of Fish and Game, Oregon State Parks and Recreation Branch, Washington Interagency Committee for Outdoor Recreation, Bureau of Land Management, Bureau of Reclamation, National Park Service, U. S. Army Corps of Engineers, and U. S. Forest Service.

3. That new household and nonresident user survey information be collected regionwide as a coordinated multistate effort. Such surveys should be constructed to meet the minimum data requirements of this program.
4. That a complete program documentation package be assembled including the computer program, a description of the inputs and input formats, program run instructions, and recommendations regarding data preparation.
5. That the Subcommittee develop uniform procedures and methodologies to inventory recreation resources and facilities.

## APPENDICES





APPENDIX A  
ACTIVITY DEFINITIONS AND CODES

<u>CODE</u>	<u>ACTIVITY AND DESCRIPTION</u>
01	<u>Camping</u> Sleeping outdoors with or without specialized equipment.
02	<u>Picnicking</u> Eating a meal out-of-doors away from home, and away from a permanent food dispensing facility.
03	<u>Swimming</u> Swimming and wading in any body of water including outdoor pools.
04	<u>Sightseeing and Driving for Pleasure</u> These may occur simultaneously or separately. Driving for pleasure: Driving or riding for pleasure in a vehicle. Sightseeing: An activity where viewing the scenery is the primary recreation experience. This most frequently requires some movement of person past scenes.
05	<u>Fishing</u> The harvest of fish noncommercially in compliance with prescribed methods.
06	<u>Boating</u> The recreational use of any type boat or floating device.
07	<u>Water Skiing</u> An activity where a person is towed behind a motor boat on water skis or similar device.
08	<u>Walking and Hiking</u> This is one activity, but it occurs on a continuum. At the low end, it is walking and consists of short distances over easy terrain, and at the high end, it is hiking and consists of long distances over more difficult terrain.

<u>CODE</u>	<u>ACTIVITY AND DESCRIPTION</u>
09	<u>Hunting</u> The harvest of game animals noncommercially in compliance with prescribed methods.
10	<u>Playing Outdoor Games</u> The playing of a large variety of activities on designated play-fields or available recreational spaces with emphasis on active participation.
11	<u>Bicycling</u> Any type of nonmotorized bicycling for pleasure.
12	<u>Golfing</u> Playing golf on any type of golf course.
13	<u>Horseback Riding</u> Riding a horse for recreation.
14	<u>Attending Outdoor Sporting and/or Cultural Events</u> Attending sporting or cultural events in outdoor facilities. Such events would include such things as: attending track and field or football games, listening to outdoor operas, or attending a water sports show.
15	<u>Participating in Snow Activities</u> Activities included in this category are: downhill skiing, snowmobiling, snowshoeing, cross-country skiing, and sledding.
16	<u>Participating in Other Activities</u> Includes all other outdoor recreation activities not included in the above.

APPENDIX B  
PLANNING AREAS AND ZONE CODES

<u>WASHINGTON</u>		<u>IDAHO</u>	
ADAMS	001	ADA	040
ASOTIN	002	ADAMS	041
BENTON	003	BANNOCK	042
CHELAN	004	BEAR LAKE	043
CLALLUM	005	BENEWAH	044
CLARK	006	BINGHAM	045
COLUMBIA	007	BLAINE	046
COWLITZ	008	BOISE	047
DOUGLAS	009	BONNER	048
FERRY	010	BONNEVILLE	049
FRANKLIN	011	BOUNDARY	050
GARFIELD	012	BUTTE	051
GRANT	013	CAMAS	052
GRAYS HARBOR	014	CANYON	053
ISLAND	015	CARIBOU	054
JEFFERSON	016	CASSIA	055
KING	017	CLARK	056
KITSAP	018	CLEARWATER	057
KITTITAS	019	CUSTER	058
KLICKITAT	020	ELMORE	059
LEWIS	021	FRANKLIN	060
LINCOLN	022	FREMONT	061
MASON	023	GEM	062
OKANOGAN	024	GOODING	063
PACIFIC	025	IDAHO	064
PEND OREILLE	026	JEFFERSON	065
PIERCE	027	JEROME	066
SAN JUAN	028	KOOTENAI	067
SKAGIT	029	LATAH	068
SKAMANIA	030	LEMHI	069
SNOHOMISH	031	LEWIS	070
SPOKANE	032	LINCOLN	071
STEVENS	033	MADISON	072
THURSTON	034	MINIDOKA	073
WAHKIAKUM	035	NEZ PERCE	074
WALLA WALLA	036	ONEIDA	075
WHATCOM	037	OWYHEE	076
WHITMAN	038	PAYETTE	077
YAKIMA	039	POWER	078
		SHOSHONE	079

IDAHO (Continued)

TETON	080
TWIN FALLS	081
VALLEY	082
WASHINGTON	083

OREGON

BAKER	084
BENTON	085
CLACKAMAS	086
CLATSOP	087
COLUMBIA	088

COOS	089
CROOK	090
CURRY	091
DESCHUTES	092
DOUGLAS	093

GILLIAM	094
GRANT	095
HARNEY	096
HOOD RIVER	097
JACKSON	098

JEFFERSON	099
JOSEPHINE	100
KLAMATH	101
LAKE	102
LANE	103

LINCOLN	104
LINN	105
MALHEUR	106
MARION	107
MORROW	108

MULTNOMAH	109
POLK	110
SHERMAN	111
TILLAMOOK	112
UMATILLA	113

UNION	114
WALLOWA	115
WASCO	116
WASHINGTON	117
WHEELER	118
YAMHILL	119

MONTANA

DEER LODGE	120
FLATHEAD	121
GRANITE	122
LAKE	123
LINCOLN	124

MINERAL	125
MISSOULA	126
POWELL	127
RAVALLI	128
SANDERS	129
SILVER BOW	130

TETON	131
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EXTERNAL ZONES

B.C.	132
E. MONTANA	133
WYOMING	134
UTAH	135
NEVADA	136

CALIFORNIA	137
ALASKA	138
HAWAII	139
CANADA	140
NORTH CENTRAL	141

NORTHEAST	142
SOUTHEAST	143
SOUTH CENTRAL	144

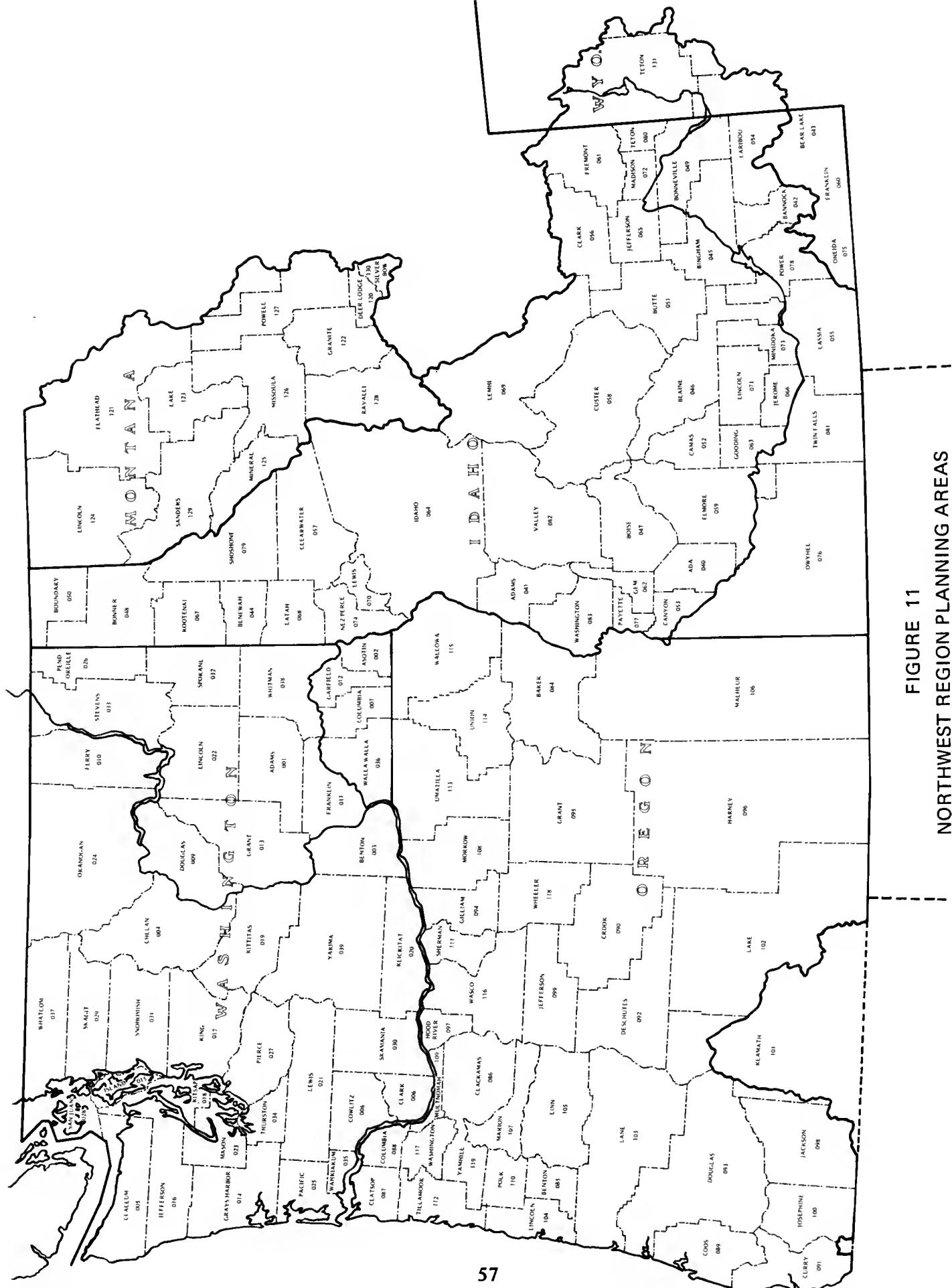


FIGURE 11  
NORTHWEST REGION PLANNING AREAS

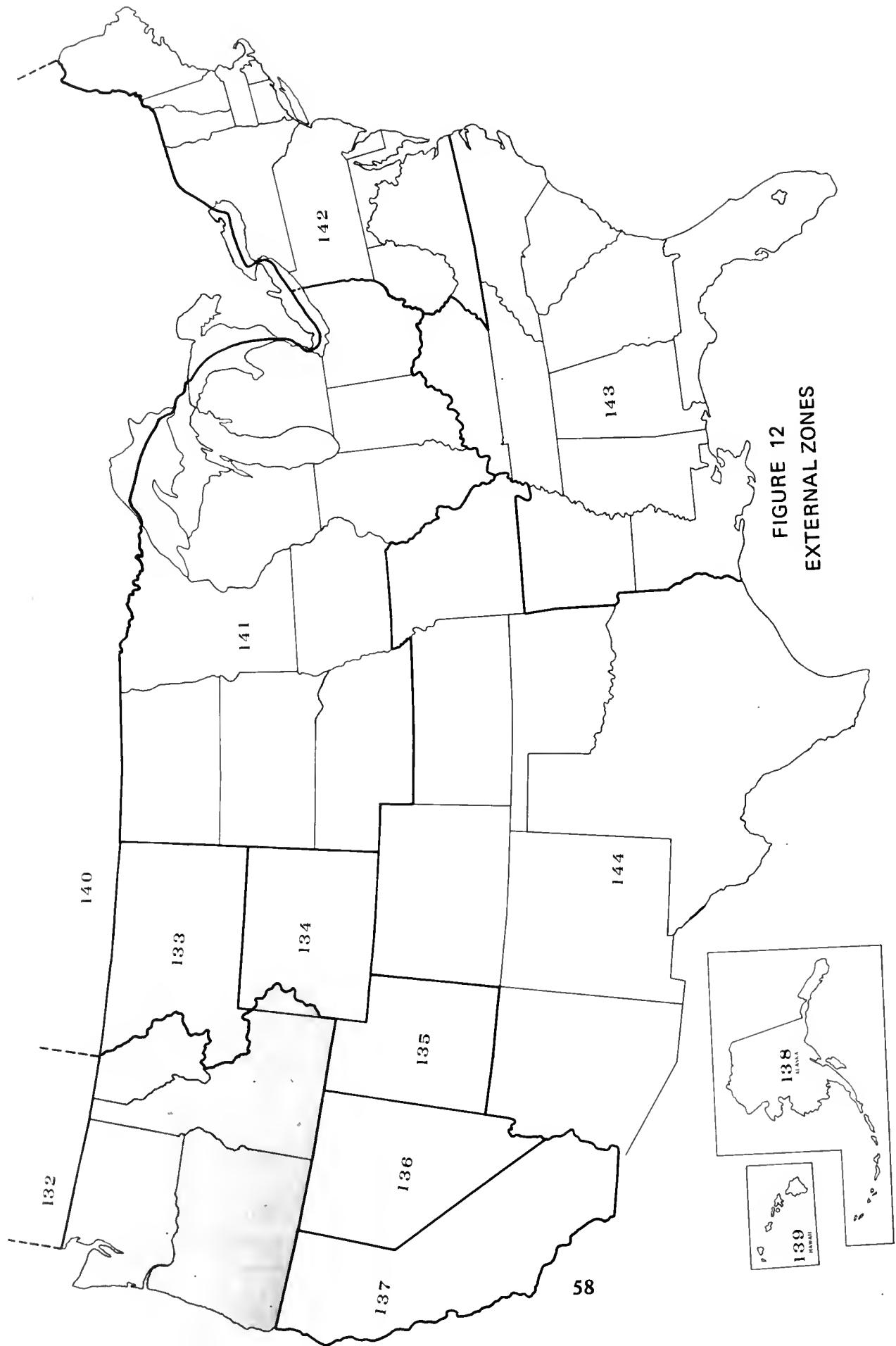


FIGURE 12  
EXTERNAL ZONES

## APPENDIX C

### TERMS AND DEFINITIONS

**ACTIVITY OCCASION:** A standard unit of recreation use consisting of one individual participating in one recreation activity during any reasonable portion or all of one day. One individual participating in three different activities during the day is recorded as three "activity occasions."

**ATTRACTION (ATTRACTIVENESS) INDEX:** An index of relative suitability of a county to provide for or "attract" recreation activity.

**AVERAGE PEAK DAY:** The amount of use occurring on the average weekend day of the peak month.

**CARRYING CAPACITY:** The total amount of use a recreation area or site can accommodate without impairment of the quality of the resource or of the recreation experience.

**CONVERSION FACTORS (STANDARDS):** Quantitative units or measurements used to convert use (usually average peak day use) to resource and/or facility requirements.

**DISTANCE DECAY FUNCTION:** A theory which states that the recreation participation rate is inversely proportional to the distance between the point of production and the point of participation.

**FACILITY REQUIREMENTS:** The number and/or types of recreation facilities required to accommodate the recreation use.

**GRAVITY MODEL:** A trip distribution model which states that trips interchanged between zones are directly proportional to the relative attraction of each of the zones and inversely proportional to the distance between zones.

**NEEDS:** The need for additional (in addition to existing supply) recreation resources or facilities.

**PARTICIPATION RATE:** Usually expressed as an annual per capita rate for a particular activity. The number of times (a year) an individual participates in a recreation activity.

RESOURCE REQUIREMENTS: The acres of land and/or water required to accommodate the recreation use.

PRODUCTIONS: The annual number of activity occasions "generated" or "produced" by the residents of a certain area.

PROJECTION: Utilizing past and present events to predict the future. Projections of recreation use are future use estimates.

PURPOSE: \* One of the 16 activities.

TOTAL TRIPS RECEIVED: \* Refers to a zone and is the total trips with this destination; the trips may be inter or intrazonal.

TOTAL TRIPS SENT: \* Refers to a zone and is the total trips produced in this zone.

TRANSPORTATION NETWORK: A computerized network of highways providing minimum driving times and/or distances from every county to every other county in the region.

TRIPS: \* Synonymous to activity occasion.

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\* Terms used in the output tables.



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*s*

*N*